

ABSTRACT

AIM: The aim of this study was to estimate the levels of orthophosphate, pyrophosphate, and enzyme pyrophosphatase from unstimulated saliva in humans using biochemical analysis, and to evaluate their activity with regard to the formation and inhibition of the dental calculus with the reference to the amount of orthophosphate, pyrophosphate, and enzyme pyrophosphatase present in the human saliva.

MATERIALS & METHODS: This clinico-biochemical prospective cross-sectional study was conducted in Department of Periodontics, Sri Ramakrishna Dental College & Hospital, Coimbatore. The study included 60 systemically healthy subjects, age ranging from 15 – 30 years, with presence of chronic generalized marginal gingivitis. The subjects were divided into 4 groups. Group I consisted of 15 subjects who had calculus index score of 0.40 to ≤ 1.00 . Group II consisted of 15 subjects who had calculus index score of >1.00 to ≤ 1.30 . Group III consisted of 15 subjects who had calculus index score of >1.30 to ≤ 1.80 . Plaque group was considered as Group IV included 15 subjects. Statistical analysis was calculated by using analysis of variable (ANOVA) and inter group comparison was done using Post Hoc test of Tukey HSD method.

RESULTS: As the calculus index score increases, there was a significant gradual increase in the levels of orthophosphate and enzyme pyrophosphatase. Eventually, there was a significant decrease in the levels of pyrophosphate in each of the calculus group. Comparatively, in the plaque group, the levels of pyrophosphate is increased significantly. And the orthophosphate and enzyme pyrophosphatase were in very low levels when compared to the values from the calculus groups.

CONCLUSION: The present study concludes that orthophosphate, pyrophosphate, and the enzyme pyrophosphatase play a significant role in formation and inhibition of the dental calculus. It is also evident that pyrophosphate being the strong inhibitor in formation of dental calculus acts as an anticalculus agent present in the human saliva.

KEYWORDS: Dental calculus; orthophosphate; inorganic pyrophosphate; pyrophosphatase; dental plaque; saliva.